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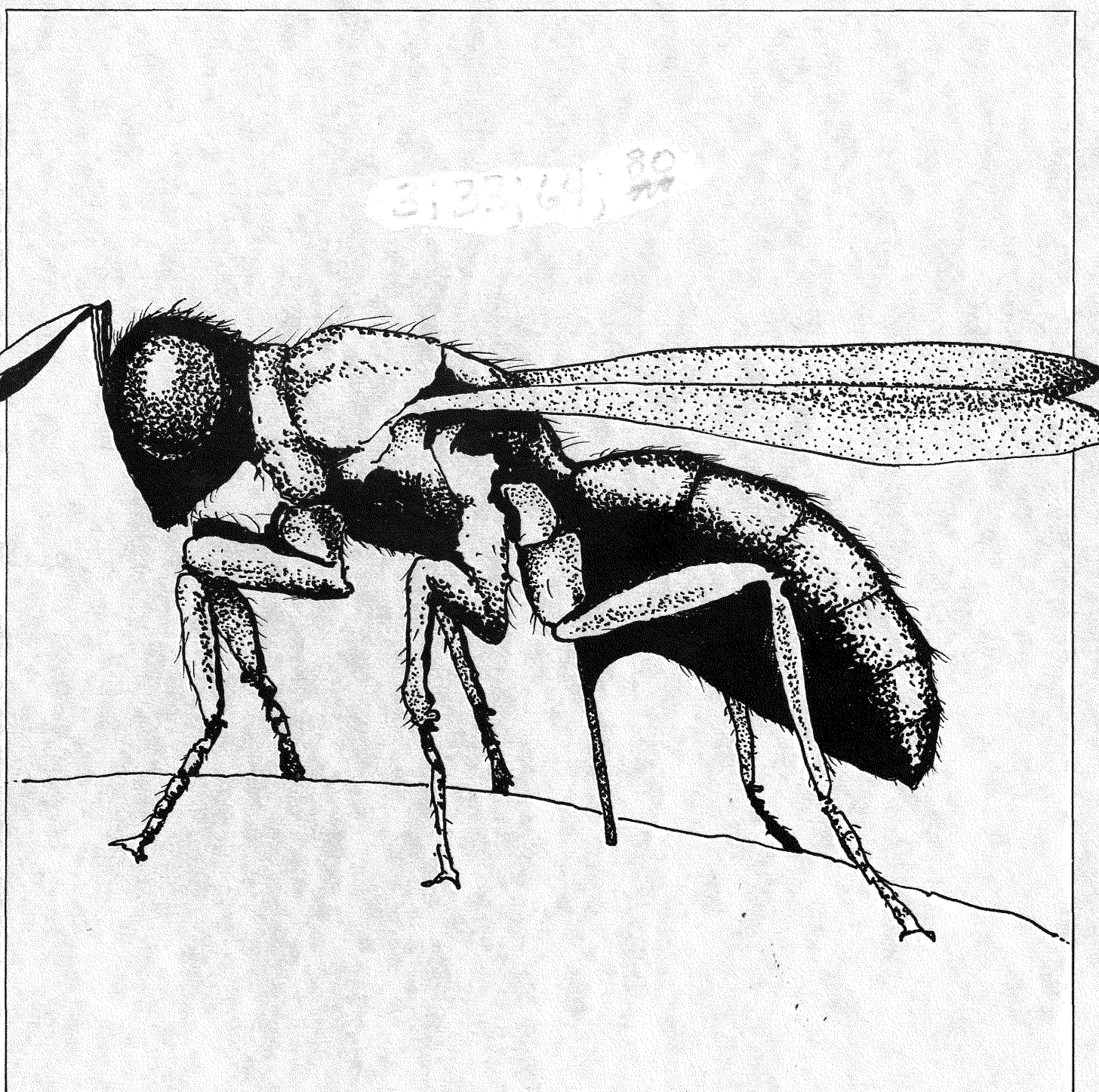
Illustrated Key to Introduced and Common Native Parasites of Larch Casebearer

Roger B. Ryan



ILLUSTRATED KEY TO INTRODUCED AND COMMON NATIVE PARASITES OF LARCH CASEBEARER

Reference Abstract

Ryan, Roger B.
1979. Illustrated key to introduced and common native parasites of larch casebearer. USDA For. Serv. Res. Pap. PNW-262, 12 p., illus. Pacific Northwest Forest and Range Experiment Station, Portland, Oregon.

A key to introduced parasites of larch casebearer and commonly recovered native parasites features labeled and highlighted line drawings to facilitate identification.

KEYWORDS: Parasites (insect)(-forest pest control, larch casebearer, Coleophora laricella, keys (insect parasites).

RESEARCH SUMMARY

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Line drawings are featured in a key to identify the following species of introduced larch casebearer parasites: Agathis pumila (Ratz.), Diadegma laricinellum (Strobl), Chrysocharis laricinellae (Ratz.), Dicladocerus westwoodii Westw., D. japonicus Yshm., Necremnus metalarus (Walk.), Elachertus argissa (Walk.), and Cirrospilus pictus (Nees). Also included in the key are some genera and species of native parasites commonly recovered from larch casebearer samples from the Western United States.

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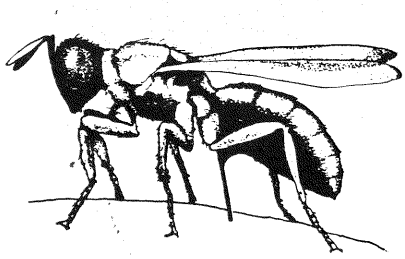


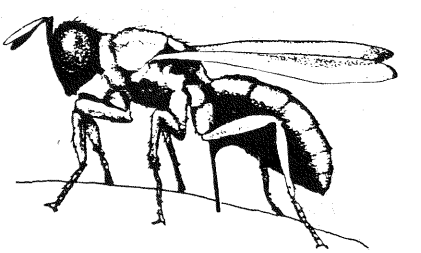
INTRODUCTION

The larch casebearer, Coleophora laricella (Hbn.), has been the object of a biological control program in the Western United States since 1960 when the European parasite, Agathis pumila (Ratz.), was colonized in northern Idaho. To date, seven species of exotic parasites from Europe and Japan have been released in the West: A. pumila, Chrysocharis laricinellae (Ratz.), Dicladocerus westwoodii Westw., D. japonicus Yshm., Necremnus metalarus (Walk.), Elachertus argissa (Walk.), and Diadegma laricinellum (Strobl) (Denton 1972, Ryan and Denton 1973, Ryan et al. 1975 and 1977). One other parasite, Cirrospilus pictus (Nees), previously released in the East, has not been released in the West because of its wide host range and sometimes hyperparasitic behavior.

A large part of the present biological control effort is devoted to evaluating the effectiveness of the introduced parasites. Evaluation requires collecting samples of casebearers from many localities where parasites have been released and, as a means of comparison, from areas where parasites have not yet become established.

Samples collected at the time of casebearer pupation in June are reared to obtain adult insects, and all parasites are identified to verify the presence or absence of introduced species and their densities relative to casebearer densities. The ability to categorize the thousands of adults emerging from numerous samples is therefore necessary. The key that follows will assist in the task of identification for those not familiar with parasite taxonomy. Technical language has been held to a minimum. Line drawings, illustrating diagnostic features, are included for key characters.[1/]

By working through the steps of the key, you will arrive at a tentative identification that will probably be correct. The key will perhaps best serve to determine what a particular parasite is not, however. Because identification of parasite species requires considerable experience, consult an expert for verification in critical cases. Additional help may also be obtained by consulting the works of Graham (1959), Marsh (1963, 1971), Peck et al. (1964), Sloan and Coppel (1965), Townes (1969), and Yoshimoto (1973, 1976).



1/ Supplementary characteristics of size and color are sometimes given. These characteristics are subject to seasonal variation and may be different if collections are made other than during the time of casebearer pupation in June.

KEY TO LARCH CASEBEARER PARASITES

1. Forewings with several veins and closed cells (fig. 1), or wingless; antennae long and thin, with 16 or more uniform segments. 2
   Forewings with reduced venation and no closed cells (fig. 2); antennae with long basal segment, then a series of not more than 10 shorter segments (fig. 24, 25) 9

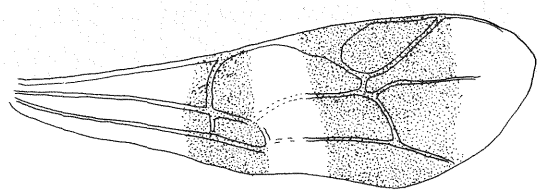


Figure 1.--Gelis sp.

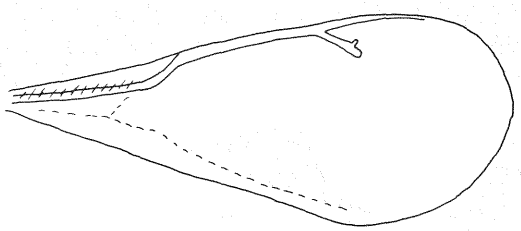


Figure 2.--Dicladocerus sp.

2. (1) Wingless, or wings with two broad smoky bands (fig. 1). . . . . .Gelis sp. (Ichneumonidae)
   Wings clear or smoky, but not banded. 3

3. (2) Forewing with cells M_1 and M_2 separate (fig. 3, 4, 11, 12) (Ichneumonidae). 5
   Forewing with cells M_1 and M_2 confluent (fig. 5, 6) (Braconidae) 4

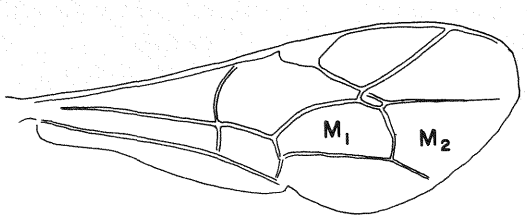


Figure 3.--Scambus sp.

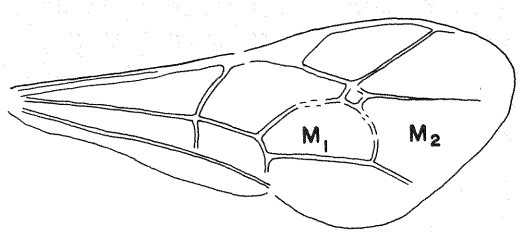


Figure 4.--Itoplectis sp.

4. (3) Radial vein of forewing reaches wing margin well before wing apex, making cell R_1 narrow (fig. 5); face with clypeus not emarginate . . . . . .Agathis pumila
   Radial vein meets wing margin near apex, making cell R_1 broader (fig. 6); face with cylpeus roundly emarginate, forming a circular opening above mandibles . . . . . .Bracon sp.

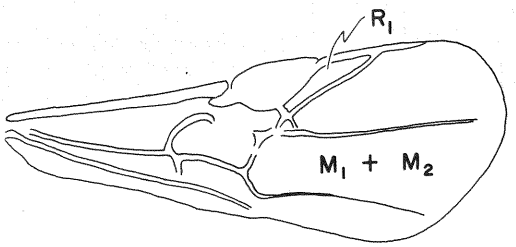


Figure 5.--Agathis pumila

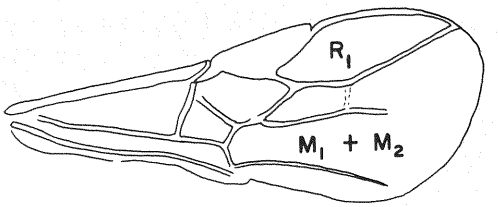


Figure 6.--Bracon sp.

5. (3) First abdominal segment broad at base (dorsal view)(fig. 7, arrow), no more than about 1-1/2 times longer than broad . . . 6
First abdominal segment narrow at base (fig. 8, arrow), about 3 times longer than maximum width. 7

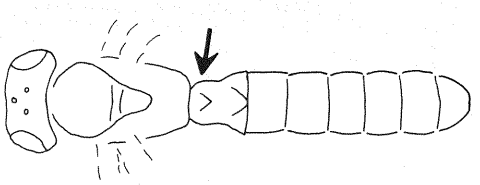


Figure 7.--Itoplectis sp.

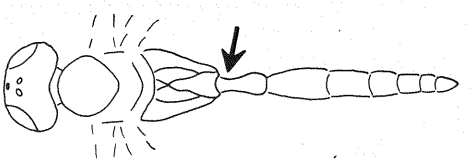


Figure 8.--Diadegma laricinellum

6. (5) Femora and tibiae of front legs white; middle tibiae uniformly white; extreme base of hind tibiae white . . . . . Scambus sp.
Femora and tibiae of front legs amber; middle tibiae banded light and dark; extreme base of hind tibiae dark . . .Itoplectis sp.

7. (5) Clypeus distinctly set off by a groove (fig. 9, arrow); face with light colored markings, at least around eyes . Pristomerus sp.
Clypeus not distinct (fig. 10); face completely dark, although mandibles may be light 8

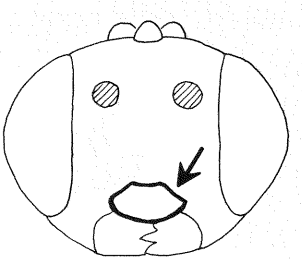


Figure 9.--Pristomerus sp.

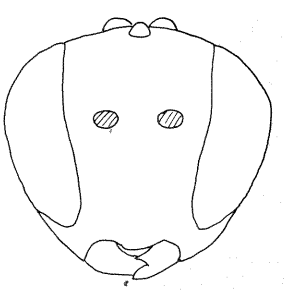


Figure 10.--Diadegma laricinellum

8. (7) Forewing with areolet present, although not complete (fig. 11); first tergite with a lateral longitudinal groove in front of the spiracle; front coxae of male dark . . . Diadegma laricinellum
Areolet absent (fig. 12); first tergite without a lateral longitudinal groove in front of the spiracle; front coxae of male light . . . . . Campoplex sp.

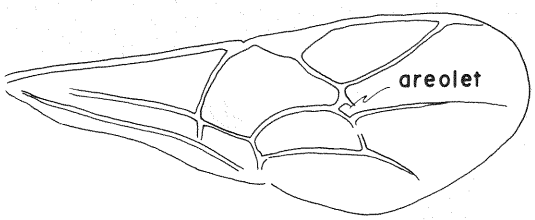


Figure 11.--Diadegma laricinellum

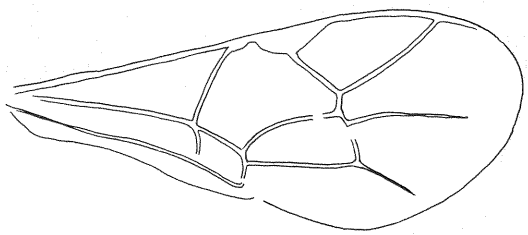


Figure 12.--Campoplex sp.

9. (1) Hind femora greatly enlarged (fig. 13), apposable with tibiae toothed and jawlike (Chalcididae). 10
Hind femora not greatly enlarged or apposable with tibiae (fig. 14). 11

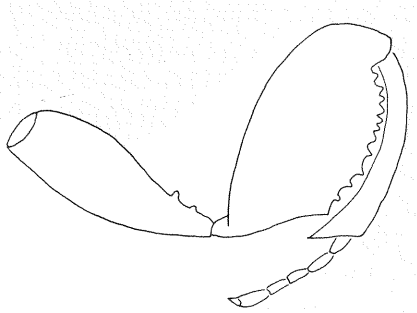


Figure 13.--Spilochalcis sp.

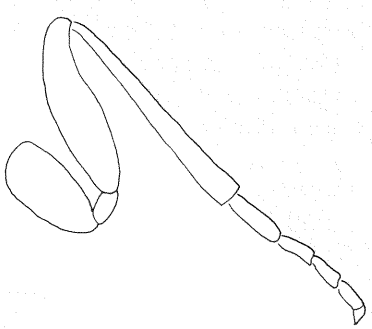


Figure 14.--Necremnus metalarus

10. (9) Face of male with light-colored, inverted V-shaped area (female rarely found on larch casebearer) . . . . Spilochalcis albifrons
Face of male entirely light-colored . . . . . Spilochalcis leptis

11. (9) Five tarsal segments (Pteromalidae) 12
Four tarsal segments (Eulophidae) 13

12. (11) Antennae inserted below middle of face (fig. 15); male green with bright yellow band on abdomen, yellow legs and yellow antennae with black club; female uniformly bronze-green . Mesopolobus sp.
Antennae inserted at midline of face (fig. 16); purplish color . . . . . .Habrocytus sp.

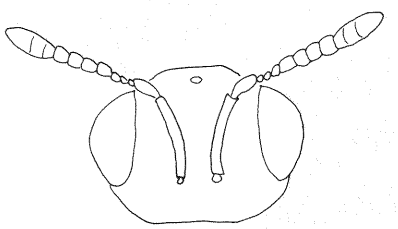


Figure 15.--Mesopolobus sp.

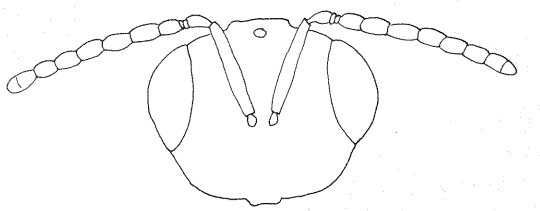


Figure 16.--Habrocytus sp.

13. (11) Scutellum with two longitudinal dorso-lateral grooves (may be indicated merely by the pattern of surface sculpturing) (fig. 17, arrow). 14
Scutellum without two longitudinal dorso-lateral grooves (fig. 18) 22

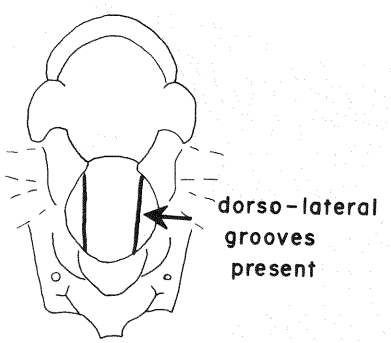


Figure 17.--Dicladocerus westwoodii

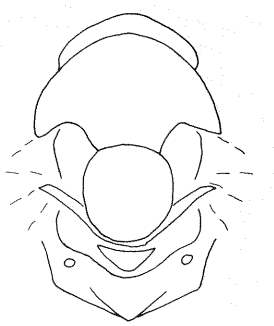


Figure 18.--Necremnus metalarus

14. (13) Parapsidal grooves complete, reaching scutellum (fig. 19). . . 15
Parapsidal grooves incomplete, not reaching scutellum (fig. 20). 18

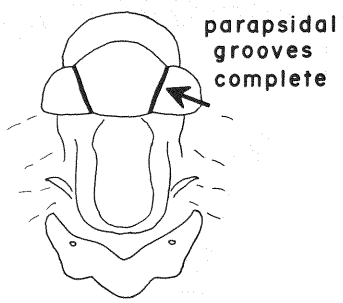


Figure 19.--Elachertus sp.

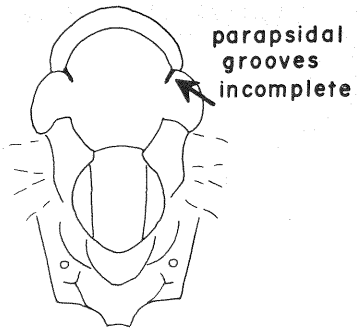


Figure 20.--Dicladocerus sp.

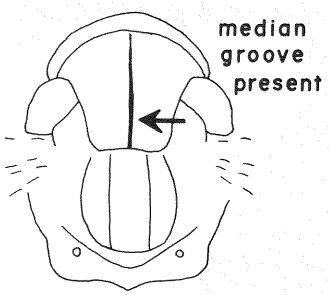


Figure 21.--Tetrastichus sp.

15. (14) Mesoscutum with median, longitudinal groove, at least posteriorly (fig. 21); forewing with postmarginal vein very short or absent, much shorter than radial vein (fig. 22). . . . .Tetrastichus sp.
Mesoscutum without median, longitudinal groove; forewing with postmarginal vein as long as or longer than radial vein (fig. 23) 16

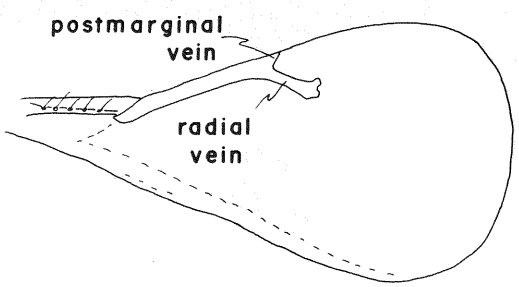


Figure 22.--Tetrastichus sp.

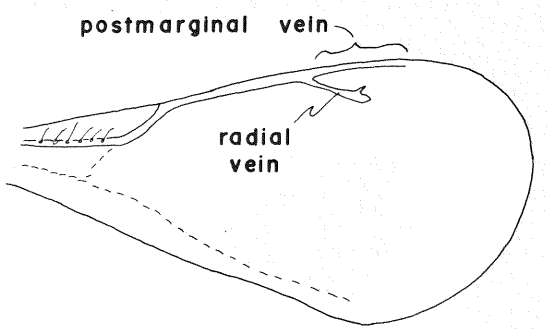


Figure 23.--Elachertus argissa

16. (15) Thorax brown, marked with yellow; antennae with two funicular segments (between ring segments and club)(fig. 24)
. . . . . .Cirrospilus pictus
Thorax black; antennae with four funicular segments 17

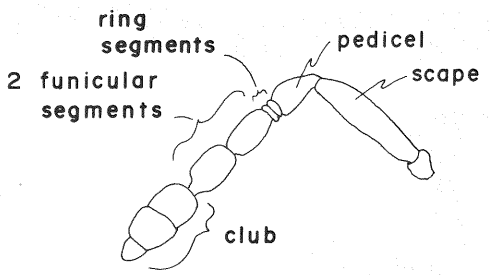


Figure 24.--Cirrospilus pictus

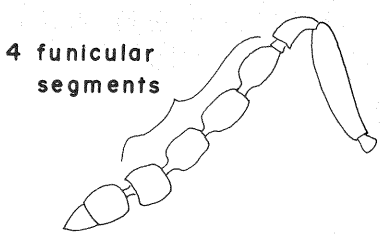


Figure 25.--Elachertus argissa

17. (16) Posterior margin of mesoscutum almost straight (fig. 26, arrow); head and thorax black with greenish reflections; abdomen brownish. . . . . Elachertus argissa
Posterior margin of mesoscutum distinctly angled (fig. 27, arrow); head and thorax without greenish reflections. . . Elachertus sp.

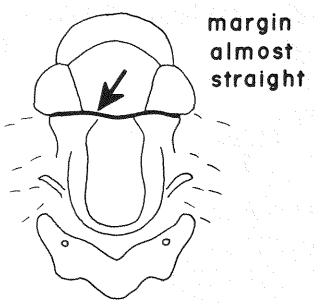


Figure 26.--Elachertus argissa

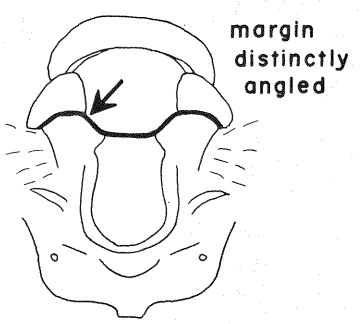


Figure 27.--Elachertus sp.

18. (14) Males. 19
Females. 21

19. (18) Funicular branches long, the distal one reaching well past the end of the next segment (fig. 28) . . . Dicladocerus westwoodii
Dicladocerus japonicus
Funicular branches shorter, the distal one reaching no farther than the end of the next segment (fig. 29, 30). 20

20. (19) Funicular branches medium length, the distal one terminating about even with the end of the next segment (fig. 29) . . . . . Dicladocerus nearcticus

Funicular branches short, the distal one reaching at most to the middle of the next segment (fig. 30) . . . . . .Dicladocerus pacificus

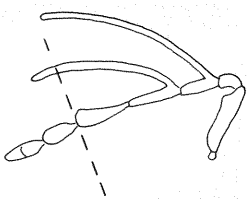


Figure 28.--Dicladocerus japonicus

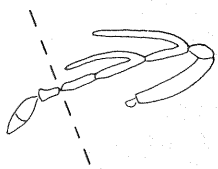


Figure 29.--Dicladocerus nearcticus

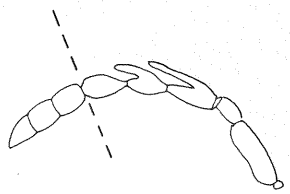


Figure 30.--Dicladocerus pacificus (after Yoshimoto)

21. (18) Medial carina of propodeum much higher anteriorly than posteriorly; when viewed from the side, an imaginary line projecting the top edge of the medial propodeal carina connects more with the line of the scutellum than that of the dorsellum (fig. 31). . . . . Dicladocerus westwoodii
Dicladocerus japonicus

Medial carina of propodem of nearly equal height throughout its length; when viewed from the side, an imaginary line projecting the top edge of the medial propodeal carina connects more with the line of dorsellum than that of the scutellum (fig. 32) . . . . . .Dicladocerus nearcticus
Dicladocerus pacificus

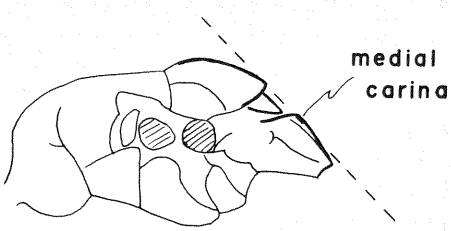


Figure 31.--Dicladocerus japonicus

Figure 32.--Dicladocerus nearcticus

22. (13) Forewing with three lines of hairs radiating from stigma (fig. 33, arrow) . . . . . Euderus sp.
Forewing without three lines of hairs radiating from stigma (fig. 34, 35) 23

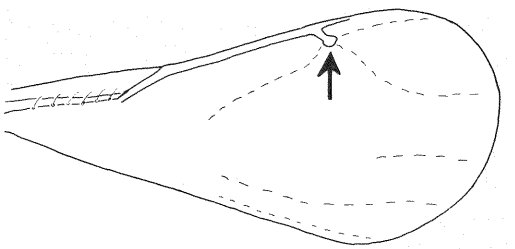


Figure 33.--Euderus sp.

23. (22) Venation of forewing not interrupted between marginal vein and submarginal vein (fig. 34); submarginal vein with more than two setae; females with smoky patch on wing beneath stigma (may be indistinct on small specimens); antennae of males with three long funicular branches . . . . . Necremnus metalarus
Venation of forewing interrupted between marginal vein and submarginal vein; submarginal vein with only two setae (fig. 35); no smoky patch on wings of females; antennae of males unbranched. 24

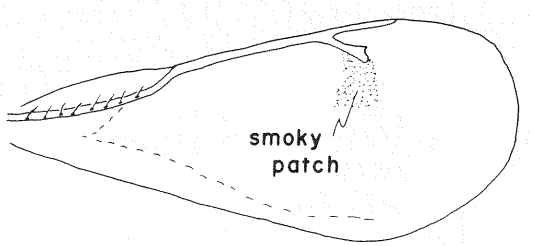


Figure 34.--Necremnus metalarus

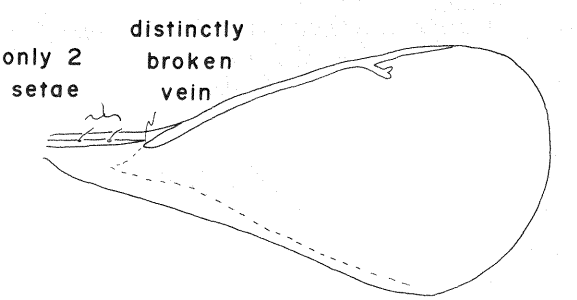


Figure 35.--Chrysocharis laricinellae

24. (23) Parapsidal grooves impressed for less than half the distance to the scutellum, represented posteriorly at most by a broad impression; anterior edge of scutellum between axillae straight; pronotal collar distinctly margined (fig. 36); specimens collected in June approximately 2 mm long, bright green body, white legs . . . . . Chrysocharis laricinellae

Parapsidal grooves distinct for more than half the distance to the scutellum; anterior edge of scutellum between axillae curved; pronotal collar not distinctly margined (fig. 37); specimens collected in June approximately 1 mm long or less, bluish-green to purplish body color. . . . . Derostenus sp.

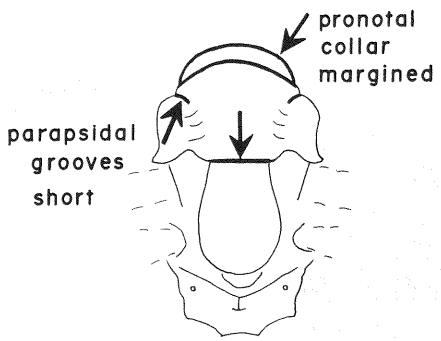


Figure 36.--Chrysocharis laricinellae

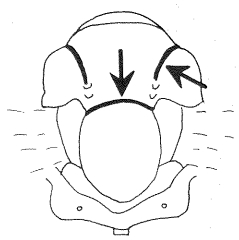


Figure 37.--Derostenus sp.

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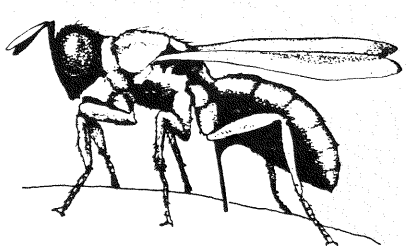

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A key to introduced parasites of larch casebearer and commonly recovered native parasites features labeled and highlighted line drawings to facilitate identification.

KEYWORDS: Parasites (insect)(-forest pest control, larch casebearer, Coleophora laricella, keys (insect parasites).

GPO 989-360

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